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Education for Sustainable Development and prioritising change: lessons from Atlantic College

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Abstract: Recent times have seen a significant increase in anthropogenic impacts on the environment that threaten the security of existing development models. These impacts have led to a global interest in the promotion of sustainable development where economic, social and environmental factors are of equal importance. Education is considered to be of prime importance in the move towards sustainable development.

This paper outlines the factors important for successful Education for Sustainable Development (ESD), and investigates the success of the Environmental Review developed for the United Nations *Eco-Schools* programme. The results suggest areas for improvement and include details of an Aims and Policy-writing Mechanism (APM), devised and tested in the process of this research. The APM provides a strong framework to support schools prioritizing change in response to successful practical ESD work. The work has produced results that are valuable to policy makers and practitioners in the field of ESD internationally.

Keywords: Schools-based Education for Sustainable Development, prioritising change, UNEP *Eco-Schools*, Atlantic College

1. Introduction

International agreement on the crucial role of education in the transition to sustainable development was reached at the United Nations Conference on Environment and Development (UNCED) in Brazil in 1992. Agenda 21 states that “education is critical for promoting sustainable development and improving the capacity of the people to address the environment and development issues” (UN 1992: Chapter 26). Subsequently, a UN Decade of Education for Sustainable Development was proposed at the Johannesburg Earth Summit in 2002. The decade, coordinated by UNESCO, came into effect in 2005 and aims to “integrate the values inherent in sustainable development into all aspects of learning to encourage changes in behaviour that allow for a more sustainable and just society for all” (UNESCO 2006a).

To date, UNESCO's initiative has helped to support and inspire a great amount of Education for Sustainable Development (ESD) work both inside and outside educational institutions. The United Nations Environmental Programme (UNEP)'s *Eco-Schools* is one of the many school-based ESD programmes available at present. The programme aims to inform and inspire students to act with a deeper understanding of environmental issues. *Eco-Schools* is used by 14,000 schools in Europe, South America, Africa and Australasia and is described by UNEP (2001: 151) as a "global model for environmental education for sustainable development." *Eco-Schools'* use internationally, its similarity to many other schools-based ESD programmes and the fact that it has not yet been evaluated by an outside body (Thurston 2005) make it a prudent choice for assessment. *Eco-Schools* have stated that they would be interested in the results of this study (ibid.). It is therefore expected that an investigation of *Eco-Schools* will produce results that inform international and national ESD practice and policy.

This paper reports on a case study of a school following elements of the *Eco-Schools* programme in Wales, UK. A flexible and eclectic approach used a combination of interviews, observations of staff and students, surveys and an audit to collect qualitative and quantitative data over a six month period. Fifty of the 330 students at the college completed an original survey and five interviews were conducted with student groups and Welsh sustainability experts. The study allowed the researcher to achieve two key tasks:

1. To monitor a school following one of the key procedures of the *Eco-Schools* process.
2. To extend and support this process with a unique Aims and Policy-writing Mechanism (APM).

2. Education for Sustainable Development

2.1 The ESD paradigm

ESD is a new, diverse and developing field which combines Environmental Education and Development Education in response to the challenges raised by Agenda 21. There is no single definition of the aims or methods of ESD, though broadly the term can be said to refer to education at any time in any place which seeks to support or encourage sustainable development. UNESCO (2006b) suggests that ESD is about learning to:

- respect, value and preserve the achievements of the past;
- appreciate the wonders and people of the Earth;

- live in a world where all people have sufficient food for a healthy and productive life;
- assess, care for and restore the state of our planet;
- create and enjoy a better, safer, more just world;
- become caring citizens who exercise their rights and responsibilities locally, nationally and globally.

The above list makes it clear that ESD places a strong emphasis on social, economic and environmental responsibility. The educational concepts of “motivation through responsibility” and “Learning by Doing” (Hahn in Hoare, 1976; Piaget in Cohen, 2002) are therefore considered by most practitioners and policy makers to be essential for the success of ESD. Naturally, student-centred work of this kind is equally dependent on teachers producing a learning environment which encourages both responsibility and practical experience.

One key to carrying out successful ESD is to adapt and modify the “best practices” from another place or situation and make them “locally relevant and culturally appropriate” in one’s own (Hopkins & McKeown 2005: 16). In the UK, for example, it is commonly accepted that the built environment and landscape of the school can either help or hinder a teacher’s ability to give practical opportunities for ESD. Evidence of this includes Prime Minister Tony Blair’s call for a new generation of schools that “feature sustainability in their bricks and mortar” (Blair 2004) and a recent spurt of sustainable school designs. Members of the Usable Building Trust’s School’s User Group concluded recently that for sustainable design features to be effective as educational tools, teachers and students alike must take an active role in their use (Usable Building Trust 2006). The interaction between teachers, students and school environment is therefore an important opportunity for ESD to occur (Weston 2005: 8–12). Interactions may be as complex and exciting as monitoring a wind turbine, or as mundane — but essential — as persuading staff and students to take responsibility for essential tasks such as opening blinds and switching off lights.

The above discussion introduces three key components identified in the UK context as being essential for any effective ESD programmes: 1) the provision of practical learning opportunities which give the student body responsibility and decision making power, 2) the involvement of the school and local community with the programme, and 3) the use of the school building and grounds as a tool for ESD. A convenient way to combine all three factors in effective ESD is for staff and students supported by local experts to make an audit of the school building and grounds to first assess and later improve upon its performance, in terms of its environmental, social and economic impact. This kind of audit-and-

respond process is known as an “Environmental Review” and is a crucial feature of many schools-based ESD programmes.

2.2 UNEP’s *Eco-Schools* in the UK

Spear-headed by UNEP, and coordinated internationally by the Federation for Environmental Education (FEE), the *Eco-Schools* initiative aims to raise environmental awareness and inspire action in schools (UNEP 2001: 151). FEE acts as an umbrella organization for the scheme and is represented in each country by a national body. In the UK, FEE works through three bodies; *Eco-Schools* Scotland, *Eco-Schools* Wales and *Eco-Schools* (which oversees *Eco-Schools* in Northern Ireland and England). These national bodies deal directly with the schools in their regions. This system is summarised in Figure 1.

FEE describes *Eco-Schools* as a seven-step process, summarised in Table 1. The table includes two columns which show the modifications that have been made to FEE’s recommended process (column 1) by the administrative bodies in England (column 2) and Wales (column 3). The modifications are in keeping with the afore-mentioned need to tailor ESD programmes to fit the localities in which they are carried out. It can be seen that the English system has three extra steps (registration, application and celebration) and does not specify involvement with the local community as a separate step. Principally, though, the general flow

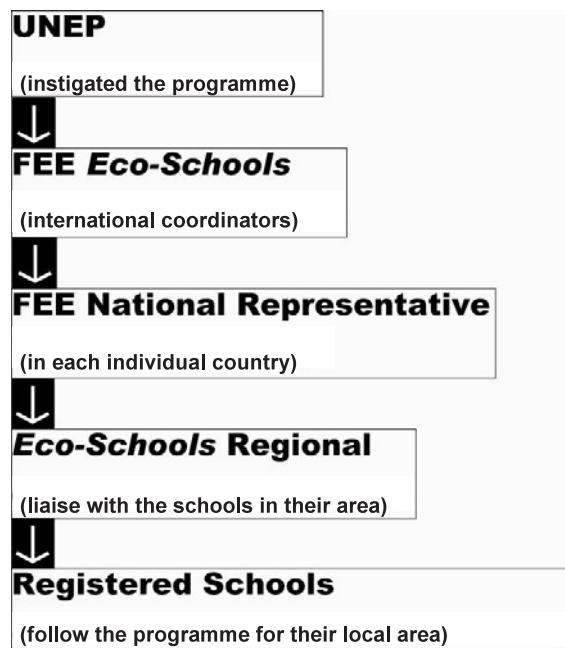


Fig. 1 Flow chart showing the Eco-Schools administration system (by author)

Table 1 Steps in the *Eco-Schools* process

Step	<u>FEE</u>	<u>England</u>	<u>Wales</u>
1	Establishment of the <i>Eco-Schools</i> Committee	Register	Eco-Committee
2	Environmental Review	Action team	Environmental Review
3	Action plan	Environmental Review	Action plan
4	Monitoring and evaluation	Action plan	Monitoring and evaluation
5	Curriculum work	Eco-code	Curriculum links
6	Informing and involving	Take action	School and community involvement
7	Eco-code	Monitor and review	Eco-code
8	n/a	Apply	n/a
9	n/a	Celebrate	n/a

Sources: *Eco-Schools Wales* (2006a), the England and Northern Ireland administrators of *Eco-Schools* (2006) and FEE (2006a).

of the *Eco-Schools* process is adhered to in both England and Wales. Key elements include forming an action-team or eco-committee which involves students and staff, conducting an Environmental Review and writing an Eco-Code which sets environmental aims for the school and monitors progress.

The Environmental Review's role is pivotal in the *Eco-Schools* process. The Environmental Review is carried out internally at registered schools by a committee of staff and students. Students are supported by staff in the collection of information necessary to evaluate the environmental impact of the whole school. Schools can either develop their own assessment method or make use of the method offered by *Eco-Schools* and available online. By collecting data on their school's environmental management process (i.e. energy use or waste systems), students become involved practically in the issues and practices which affect the environment at their school. In the steps following the Environmental Review, students are expected to take responsibility for writing their school's Eco-Code which sets aims of how to reduce their school's environmental impact.

Environmental Reviews conducted in this fashion are the key way in which ESD in schools can incorporate the important local, practical and building-related aspects outlined in Section 2.1. Environmental Reviews can therefore play a crucial role not just in the *Eco-Schools* initiative but in other school-based ESD programmes. There are three initiatives in place in Wales at present which make use of Environmental Reviews: these are *Pathways*, the World-wide Fund for Nature's schools-based ESD programme; Pembrokeshire County Council's *Sustainable Schools Award*; and Atlantic College's independent ESD work.

3. The case study

3.1 The United World College of the Atlantic (Atlantic College)

The case study was conducted at Atlantic College in South Wales between August 2005 and January 2006. Atlantic College is attended by an average of 330 sixteen to eighteen year-old students from 70 countries who study for the International Baccalaureate.¹ The majority of students board at the college. Entrance is selective, but places are made available to all capable applicants who meet the college's entrance requirements through the provision of scholarships. The college's pedagogy hinges on the philosophy of "motivation through responsibility" introduced in Section 2.1. For example, students are required to take part in community service in addition to their academic commitments.

The school's long-term commitment to sustainability issues made it a good choice for this case study. A professional report commissioned in 2002 by the college on its energy systems found that the school's environmental performance in terms of energy use was very poor. The report concluded that "there is little employee awareness of energy efficiency" (Palmer 2002). Recent work at the college suggests, however, that although performance may have been poor in the past, Atlantic College has a clear institutional commitment to reducing its environmental impact: the largest biomass boiler in the UK is in operation on the site and a new residential block with sustainable design features has also been commissioned. The college farm has recently been certified organic and *Environmental Action* — the college's primary environmental student group — has implemented recycling and composting programmes on campus. Other student groups are equally active on different aspects of sustainable development such as fair-trade and civil justice.

As the school is residential and selective, it is atypical of schools in the UK. To some extent, this might limit the ability of the researcher to extrapolate results gathered in the case study to discuss schools in general. It may be argued, however, that the school is similar enough to any other school for the results of the study — if analysed with due care and attention — to be of relevance to other schools. Alternatively, it may be argued that there are no "typical" schools.² More important yet, Atlantic College's special features — in particular the commitment and drive of the students and staff, and its ideological commitment to community and service — mean that the college can be considered an exemplary model.

3.2 Integrating *Eco-Schools* procedures at Atlantic College

Atlantic College was not involved in the *Eco-Schools* initiative at the time this study began. The author applied to *Eco-Schools* on Atlantic College's behalf, but

was unable to have the college registered within the time-frame of the research. Instead, the *Eco-Schools* Environmental Review was integrated into existing work at the college after consultation with staff at *Eco-Schools Wales*, and with reference to *Eco-Schools Wales* literature available on-line.

Existing work at the college had already resulted in the formation of an environment focused action group, *Environmental Action*. Step one of the *Eco-Schools Wales* process was therefore already complete. Because of the commitment of the staff and students and the structure given by the aims and policy writing mechanism devised in this work, the school was able to complete all the remaining steps of the process in the course of the case study, with the exception of the monitoring and evaluation stage which is currently in progress.

As students did not have full access to all the materials provided by *Eco-Schools Wales* to schools registered under its programme, evaluations drawn from the case study cannot be used to criticise specific elements of the *Eco-Schools* programme. However, the process does provide an insight on how the case-study school progressed from an Environmental Review to writing an Eco-Code and what difficulties were faced in the process. As established in Section 2.2, the progression from Environmental Review to Eco-Code is central both to the success of the *Eco-Schools* programme and many other holistic schools-based ESD programmes in the UK.

3.3 Methodology

Over the six-month period, four extended visits were made to the case study school. Meals, breaks, classes and extracurricular activities were taken with the students and staff and the researcher slept in on-site accommodation. Regular meetings with the Vice Principal, the Estate Manager and the student group *Environmental Action* were held during and between visits. A multi-method approach was used to maximise the type of data collected at the school. A tailor-made questionnaire was distributed to over 15 per cent of students at the college with a 100 per cent return rate and interviews were held with staff and students. Throughout the six-month period, observations of the school's systems and the actions of the staff and student body were recorded in a research diary.

The first and second visits allowed the researcher to get to know staff and students at the school, and set up the details of the case study. The *Eco-Schools* Environmental Review was conducted by the students on the researcher's third visit. In reaction to the preliminary findings of this work, a unique Aims and Policy writing mechanism was devised and tested between the third and fourth visit. In order to broaden the scope of the case study, and allow the author to develop a sense of how representative her findings at Atlantic College were of the

experiences of other schools, requests for data regarding other schools were submitted to *Eco-Schools Wales*. These requests were declined, as *Eco-Schools Wales* was of the opinion that gathering new data was more important for evaluating Atlantic College’s performance than collecting old data for the purposes of comparison. For this reason, extending the collection of primary data to a number of other schools was not within the scope of the research at the time.

Instead, the researcher confirmed and compared her results through the means of a series of interviews, conducted over the same period as the case study. Claire Fowler of the Welsh Assembly’s focus group on ESD and Global Citizenship, Paul Allen of the Centre for Alternative Technology and Damian Randle of the University of East London and the Open University all gave up valuable time to discuss ESD in the Welsh context with the researcher. As all three individuals have worked closely with ESD on a daily basis in Wales, their knowledge and experience have added breadth to the research.

3.4 Atlantic College’s experience of the *Eco-Schools* Environmental Review

Eco-Schools Wales defines the aims of the Environmental Review as follows:

The environmental review should look at all the school’s environmental impacts to enable the Eco-Committee to determine the priorities. The review will provide a baseline from which improvements can be made and measured. (Eco-Schools 2006)

The 2005 version of the *Eco-Schools* Environmental Review was provided to the student group, *Environmental Action* by the researcher. The review was a seven-page survey covering seven topics: litter, waste minimization, energy, water, transport, healthy living and school grounds. For each topic students were asked questions regarding the school’s practices to which they had to answer ‘Yes’ or ‘No’. The complete form is too lengthy to include here but example questions are shown in Table 2.

Table 2 Extract from the *Eco-Schools* Environmental Review

Is there someone in your school who has special responsibility for monitoring the consumption of energy (electricity, heating etc.) in the school? If there is, who is it?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are the energy metres (e. g. electricity metres) easily visible to pupils? Are pupils involved in taking and displaying readings?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
Has your school taken any of the following low-cost steps to reduce heat loss through windows? Draught excluding strips Solar reflecting film Responsible class window monitors	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No

Source : *Eco-Schools* 2006

A group of five first- and second-year students worked together to complete the survey. In order to speed up the review process and maximise opportunities for involvement the students worked in two teams, as a pair and a group of three. To answer these questions the students went to the appropriate parts of the school to gather data. They also made visits to appropriate staff members for answers and searched through records provided by the school's catering staff and Estate Manager. In total, the survey took three hours to complete, after which the students were interviewed informally as a group by the researcher. In order to allow the students freedom to express their views, the interview was semi-structured, and members of staff were not present during the interview.

Over the course of the group interview, it became clear that for the most part, the education the students had received prior to coming to Atlantic College or during their time there had equipped them to understand the significance of the questions being asked. For example, in the case of the energy question cited above, students were able to explain that heat is lost through windows and therefore in the UK fitting suitably sized curtains can help to reduce energy use. When asked to evaluate the Environmental Review, the students commented positively:

It brought up some things that I wasn't aware of and it reminded me to find out some more information. (*Environmental Action Student*)

I've definitely learnt a lot more about actually implementing environmental solutions. I've learned already about stuff that you should do but now I'm learning how you actually do it. (*Environmental Action Student*)

Later in the interview, the students reported that working practically, not just in the Environmental Review but through their work as participating members of Atlantic College's *Environmental Action* group, the review had given them a fuller understanding of environmental issues.

Throughout the case study, the author observed the students learning by doing and being motivated through responsibility. Both these factors have already been established to be crucial elements of success for ESD programmes. It was observed by the researcher and staff at Atlantic College that each time the students were shown that their help was necessary to exact change, learning and action were prompted. This was particularly evident in the period which immediately followed the completion of the *Eco-Schools* Environmental Review. Figure 2 shows a poster made by *Environmental Action* students to raise other students' awareness of energy conservation. It provides a good example of the



Fig. 2 Poster by *Environmental Action* students at Atlantic College (photograph by author)

students taking responsibility to disseminate the results of their ESD into the wider school community. Such activity suggests that the *Eco-Schools* Environmental Review carried out at Atlantic College was effective in motivating students, raising their awareness and provoking a change in actions.

3.5 After the Environmental Review

The completed Environmental Review form showed clearly where the school was failing. Yet students and staff remained confused as to which of the many items circled “no” on their seven-page completed form needed to be dealt with first. What should be their first priority? Should they work to reduce the food miles travelled by the food sold in the school canteen? Or should they start with the school’s waste water system? Or were curtains for windows more important than either?

Atlantic College’s difficulties in prioritising which changes most needed to be made, and when, were not unusual. In individual semi-structured interviews with the author held in late December 2005 and early January 2006, Welsh sustainability experts Allen and Fowler explained that a key limitation to ESD work in Wales at present is that schools seeking to improve their environmental performance are frequently swamped by possibilities and unsure where to start in the wake of an Environmental Review. Another common problem raised by Fowler was that

under the *Eco-Schools* system, all individual changes are awarded the same credit. Under this system, there is a danger that schools will tend to tackle only smaller changes in preference to larger issues.

This was an issue also noted by the students themselves. Having suggested that some elements of the *Eco-schools* Environmental Review should be “dropped”, one student gave the following reasons as to why he felt this way:

I would say that [the] irrelevance [of the bits that could be dropped] is the fact that they're not really connected with the environment ... you kind of think they're not really as relevant as some of the other ones related to electricity or water. (*Environmental Action* student)

The student's remark accorded with behaviour observed by the researcher during the carrying out of the Environmental Review, at which time students appeared to be taking some sections of the audit more seriously than others. When interviewing the students, the author asked which parts of the environmental audit were most important. The popular consensus was that “energy, waste and water” should be prioritised.

In the period following the Environmental Review, the author and staff at Atlantic College observed that students appeared enthusiastic to assess the college's impact in greater detail. Students and staff asked for the researcher's advice in assessing which information to use and what changes would have the most impact. Such requests indicate strongly that after an Environmental Review has taken place, a great deal of support is needed to help the action group in question prioritise change. A strategic and embedded system for prioritising aims and writing policy would appear to be vital for all schools-based ESD programmes which feature an Environmental Review.

4. The Aims and Policy-writing Mechanism

4.1 From Environmental Review to Eco-Code

Welcomed both as a guest and expert by staff and students at the case study school, the researcher believed it would be unethical to leave the school's problems with prioritising change unaddressed. The solution, an Aims and Policy-writing Mechanism (APM), was devised and tested by the author in the latter part of the case study, as a means to help the college determine an Eco-Code for its future environmental performance. In Atlantic College's case, the APM helped to implement the seven steps recommended by FEE (highlighted in Section 2.2) by structuring the college's progression from Environmental Review

to Eco-Code. The APM as such offers an extra but vital step in the *Eco-Schools* programme, making liberal use of teaching techniques observed and experienced by the author to date and owing a great deal both to the students and staff at Atlantic College and the expertise of NGO members and other experts involved in the case study.

Devising the APM created a new dynamic between the parties involved at the case-study school as the process required the researcher to become a teacher, the students to become researchers and the staff and students of the school to become students. This changing of roles enabled a knowledge base regarding the school's environmental impact and global and local environmental issues to be developed at the school. The new understanding of wider issues empowered the school community to attempt through workshop exercises to prioritise and state the school's sustainability aims as an institution. An important characteristic of the APM is that while a large number of people can contribute to the writing of the Eco-Code, its results can be clearly presented as an Aims and Policy sheet in a single A4 page format. This allows the school and any interested party easy and permanent access to both the APM and its results.

The APM can be summarised as a simple four-stage process:

1. Researcher supports students in their own extensions.
2. Researcher performs a carbon audit, supported by the students.
3. Researcher, students and invited members of outside groups present findings and suggestions to the school.
4. Whole community works together to write the Eco-Code on the Aims and Policy sheet.

The presentation and analysis of the results conveyed in the next sections follow this sequence.

4.2 APM Stage One: researcher supports students in their own extensions

After performing the *Eco-Schools*' Environmental Review, Atlantic College's student group committed itself to finding out which aspects of the school's environmental impact could most easily be changed, which were most important to change, and how might they be changed. As noted in Section 3.5, difficulties in prioritising environmental actions are common in schools-based ESD. Paul Allen of the UK's Centre for Alternative Technology recommends a carbon audit to help identify key areas for focus in situations such as the one faced by Atlantic College. To test this idea, a carbon audit was performed at the case-study school — forming Stage Two of the APM.

4.3 APM Stage Two: the carbon audit

4.3.1 *What is a carbon audit?*

A carbon audit is a process which allows an institution to measure its environmental effect in terms of the amount of carbon dioxide or equivalent green-house gases emitted by a given activity. Yohemas (2001) reports that carbon audits of 161 schools in Alberta, and the energy conservation measures that followed, have resulted in an annual saving of over \$450,000 and a sound educational effect. He notes that

A detailed analysis [of carbon emissions] can become quite complicated and, for most schools, is unnecessary. The main point of initiating action on climate change is not to determine exact emissions levels but to implement day-to-day solutions (Yohemas 2001: 56).

The carbon audit was particularly suitable for use at Atlantic College because of the students' need to compare the environmental impacts of activities as diverse as heating and transportation. In the UK, international agreements such as the Kyoto Protocol and wide-ranging concerns regarding climate change have made it common practice to discuss and compare environmental impacts in terms of units of carbon, where carbon refers to the amount of carbon dioxide or carbon dioxide equivalent emitted as a result of a process. This national concern was echoed at Atlantic College: the researcher's survey of the student body found that over 75 per cent of respondents considered climate change to be the most important environmental concern.

4.3.2 *Conducting the carbon audit*

Carbon audits can be conducted by professionals or any interested person or persons. The audit carried out at Atlantic College — a three-step process created by the author with reference to Yohemas (2001) and Allen (2005) — was as follows:

1. List all activities which emit carbon dioxide.
2. Determine values for amount of each activity.
3. Convert values to carbon dioxide using a conversion factor.

The carbon audit at Atlantic College was performed by the researcher with the support of the students and staff. The energy consumption of all buildings on site, the travel of the students from their home countries and the fuel used by the college's vehicles were included in the calculations. Figures for energy use were collated from energy bills and school records with the assistance of students and

Table 3 Scenarios for reducing carbon emissions at Atlantic College (by author)

Reduction method	Reduction on 2004 emissions
All students stay in the UK for the winter holidays	10%
All students from Asia and Europe travel to the college by train	6%
Energy efficiency measures achieve 10% cuts in heating and electricity	8%
Energy efficiency measures achieve 10% cuts in electricity only	3%
50% of electricity is provided by renewables	17%
Energy efficiency measures achieve 10% cuts in heat and electricity and renewables provide 50% of electricity	42%
All the measures mentioned above are taken	56%

staff. The school's total carbon emissions for 2004 were calculated to be 1,842,697 kg of CO₂ in the year 2004–2005. This figure is equivalent to the amount of CO₂ absorbed by 614 acres of trees³ or the emissions created by travelling 13 million miles in a diesel car.⁴ The information was used by the researcher to create the scenarios shown in Table 3, which shows estimates of the relative effects of a number of different measures to reduce carbon emissions in terms of the school's environmental impact.

In any carbon audit, the answers obtained vary according to the boundaries used when choosing which activities to assess in terms of carbon emissions. For example when considering the emissions associated with the activity of cooking, the energy used to cook the food should clearly be calculated. However, should one also factor in the energy used to transport the food to the college? How about the energy used to process the food prior to its delivery? Or the fuel used to transport the staff to the canteen? Evidently, the choice of what activities and where to set boundaries makes a great difference to the size of emissions calculated. To some extent, the selection of activities and boundaries will depend on the ease of data collection. However, the choices made in a carbon audit will also depend on the institution's willingness to ask itself difficult questions with regard to its impacts on the environment. In Atlantic College's case, performing the carbon audit raised a number of challenging questions: Did the college really want to know the scale of its contribution to climate change? What if the size of the emissions called into question the ideals and structure on which the college itself was based?

It may be argued that the process of carrying out a carbon audit is only useful as an educational tool when the limitations of the methods used are confronted directly during the course of the audit. For this reason, the author worked with students to keep a comprehensive record of the methods used and encouraged discussion regarding the implications of the boundaries chosen and assumptions made. The aim was not simply to compile a list of figures and arrive at a total, but

to understand the importance of the data compiled and its relevance in terms of wider sustainability issues.

4.4 APM Stage Three: presentation to the college

The third stage of the APM allows the results of the Environmental Review and APM Stages 1 and 2 to be shared with the wider community. On the day of the APM's presentation, all staff and students at Atlantic College were allowed to miss classes in order to attend. Three outside experts were in attendance: Chris Hines from the Eden Project, a visitor centre in South West England which provides environmental education for schools and the public; Megan Jones from the devolved Welsh Government; and the researcher. Presentations were given by *Environmental Action* students, Chris Hines and the researcher. The presence of outside experts signified the importance of the occasion, improving motivation levels and fostering the development of relationships which will support the school in future work.

At the opening of the session, the *Environmental Action* students presented their suggestions for ways of reducing the college's environmental impact. Next, Chris Hines introduced the basic theory of sustainable development. The researcher then presented the results of her case study with a specific focus on the carbon audit. She used graphs and tables to demonstrate the effects of possible schemes to reduce emissions at Atlantic College. The presentations were followed by group work which allowed students to contribute individually to the preparation of an Eco-Code for the college.

Prior to the event, the researcher prepared an Aims and Policy Sheet as a way to set out an Eco-Code for the college onto a single sheet of A4 paper. The Aims and Policy Sheet includes spaces to list 1) praise for present work, 2) short-term aims and 3) long-term aims. For each of these three headings, there is space to make three suggestions. Blank copies of the Aims and Policy Sheet were distributed to all the persons present at APM stage 3. Guidance on filling in the form, along with an explanation as to its purpose, was given by the researcher at the end of her presentation. The reverse of the form gave a hypothetical example for "School X", to aid staff and students in filling in the Aims and Policy Sheet. Information from the example is shown in Table 4. The Aims and Policy Sheet was designed and utilised in this way by the researcher in order to

Table 4 Sustainable aims for "School X" (example only)

Praise for existing work	Short-term aims	Long-term aims
1. Good use of bicycles	4. Composting system	7. Renewable energy for electricity
2. Low energy light bulbs	5. Low flush toilets	8. Local bread
3. Biomass boiler	6. Recycled toilet paper	9. Local, organic milk

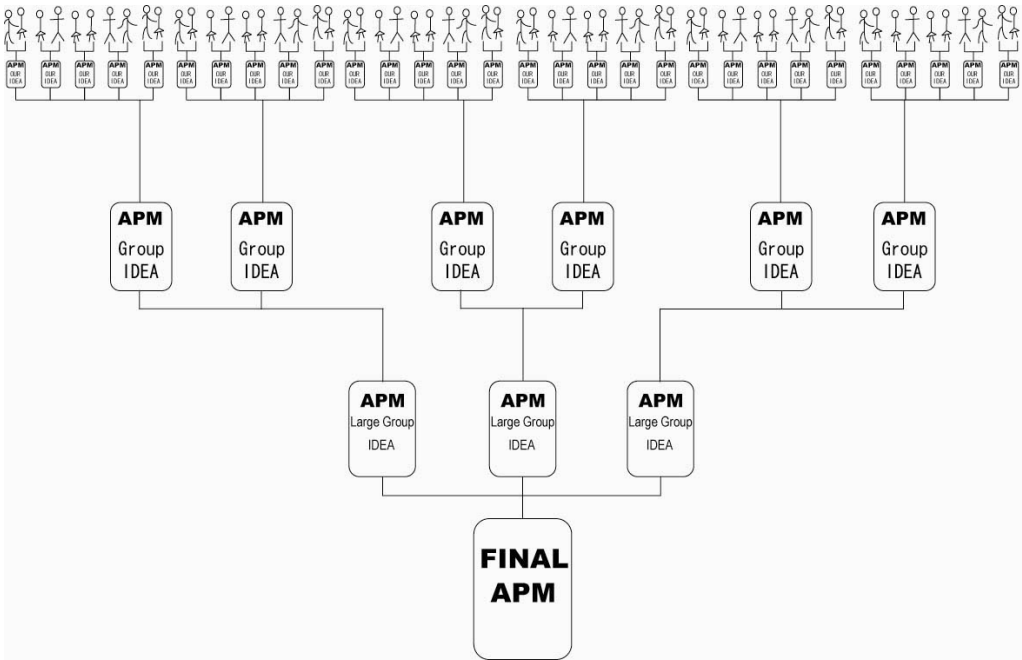


Fig. 3 Flow-chart showing how the workshop exercises enabled a large group of people to write aims and policy together

maximise involvement and facilitate individual contributions to setting aims and policy.

After the guidance session, attendees began work in pairs to fill in the Aims and Policy Sheet with their suggestions (see Figure 3). The pairs then joined other pairs to form a small group. Each pair presented their ideas to the rest of their group and then after a discussion the small group worked together to establish their preferred aims and policy. This process was repeated, with groups combining to form larger groups, until there were just three large groups. At this stage, each group of approximately 15 to 20 people worked as a unit to complete an Aims and Policy Sheet that satisfied the whole group. A representative of each of the three groups then presented their group's suggestion to a small panel of students, staff and experts. This panel then worked in Stage Four of the APM (described in Section 4.5) to unite these visions to create a single, achievable Eco-Code for the whole college.

The process of completing the Aims and Policy Sheet allowed the college staff, students and outside experts to collaborate in the production of an Eco-Code for the college. During the session, the outside experts worked with the students and staff, as seen in Figure 4. Meanwhile, the researcher and leaders of *Environmental Action* circulated amongst the groups to support the discussions taking place. Working in this way enabled the school to make best use of



Fig. 4 Students, staff and NGO members working together to complete the Aims and Policy Sheets

the interest and knowledge of the researcher and the outside bodies in attendance. It should be noted that the role taken by the researcher could be played by an *Eco-Schools* assessor or a member of any outside body with relevant experience.

4.5 APM Stage Four: prioritising aims and writing an Eco-Code

In the final stage of the APM, a small panel of key staff and student members met to condense the three Aims and Policy Sheets created in Stage Three of the APM process into a single Eco-Code for the whole college. Rather than make final recommendations to the college, the role of the outside experts was to observe and only give advice upon request. Enabling the staff and students of the college to construct their own Eco-Code is in keeping with the *Eco-Schools* approach and is preferable for the following reasons:

1. True appreciation of the financial, technical and social implications of the recommendations lies with the college students and staff.
2. Engaging the students and staff in writing the recommendations provides an educational opportunity.
3. An Eco-Code agreed collectively by students and staff is more likely to be understood and followed than aims and policy written by an outside group.

The resulting Eco-Code is presented on the Aims and Policy Sheet shown in Figure 5.





<p style="text-align: center;">Atlantic College-Sustainability Policy and Aims</p> <p style="text-align: center;">St Donats' Castle, Llantwit Major, Vale of Glamorgan 6th Form College, 340 pupils, 50 staff, over 60 nationalities</p>		 <p style="text-align: center;">Teaching Block</p>
POLICY	Atlantic College recognises that the college's ideals of peace and understanding prescribe a commitment to fostering environmental awareness and responsibility. To this end the college will endeavour to make every effort to reduce its own environmental impact and enable and inspire students to reduce theirs.	
PRAISE FOR EXISTING WORK	 <p style="text-align: center;">Energy saving advice poster by student group</p>	<ul style="list-style-type: none">* Ensure students and local community understand Biomass.* Produce a tour guide sheet <p style="text-align: center;">1/BIOMASS BOILER</p>
		<ul style="list-style-type: none">* Link reduction and recycling to financial gain for the College <p style="text-align: center;">2/RECYCLING</p>
		<ul style="list-style-type: none">* Shift focus from awareness to responsibility and action <p style="text-align: center;">3/AWARENESS AND MOTIVATION</p>
SHORT-TERM AIMS	 <p style="text-align: center;">Pipe insulation — not sexy, but a good place to start</p>	<ul style="list-style-type: none">* Monitoring of electricity use in student homes with reports of data.* Achieve by JUNE 2007 <p style="text-align: center;">1/ENERGY MONITORING</p>
		<ul style="list-style-type: none">* Review of work to be completed by <i>Environmental Action</i> by MAR. 2006* Work completed by JAN. 2007 <p style="text-align: center;">2/QUICK SIMPLE EFFICIENCY MEASURES</p>
		<ul style="list-style-type: none">* Produce website to put Atlantic College's environmental work in the public domain by SEPT. 2006 <p style="text-align: center;">3/COMMUNICATION</p>
LONG-TERM AIMS	 <p style="text-align: center;">Machynlleth community wind turbine</p>	<ul style="list-style-type: none">* Work with food committee to put ecological concerns on the agenda* Find local, seasonal sources for canteen staples. <p style="text-align: center;">Ongoing from JAN. 2006</p> <p style="text-align: center;">1/BREAD BUTTER AND POTATOES</p>
		<ul style="list-style-type: none">* Research renewable energy and funding available to the college.* Become more energy self sufficient every year. <p style="text-align: center;">2/RENEWABLE ENERGY</p>
		<ul style="list-style-type: none">* Commission a composting system for Atlantic College by JAN 2008. <p style="text-align: center;">3 /KITCHEN WASTE</p>
Written by the staff and students of Atlantic College, Sara Turnbull (Centre for Alternative Technology), Chris Hines (the Eden Project) and Megan Jones (Welsh Assembly)		CREATED : 13/ 01/ 06 REVIEW : 13/ 01/ 07
A4 Report Pro-Forma devised and created by Sara Turnbull turnbull_sara@hotmail.com © December 2005		

Fig. 5 Atlantic College Aims and Policy Sheet

5. Conclusions

In identifying the strengths and weaknesses of the *Eco-Schools* Environmental Review, elements of the *Eco-Schools* programme have been independently assessed for the first time. This case study indicates that the *Eco-Schools* programme facilitates ESD work of a high standard by providing important factors for successful learning such as “learning by doing” and “motivation through responsibility”.

The difficulty in prioritising aims after Environmental Reviews has been highlighted as a barrier to ESD provision in schools throughout Wales and the *Eco-Schools* system. The Aims and Policy writing Mechanism (APM) devised and tested in this case study addresses the problem. The APM features the use of a carbon audit which simplifies the comparison of environmental impacts by providing a single unit for comparison. Discussion and openness about the limitations and benefits of the carbon audit encourages a holistic understanding of the complexities of sustainable development. The APM was found to be a simple and engaging structure for moving from an Environmental Review to the production of an Eco-Code. The system mimics the *Eco-Schools* recommended progression from Environmental Review to Eco-Code but serves to strengthen the framework by which this can be achieved.

The success of the APM was due to many factors, including support from NGOs and outside bodies and the motivation of the staff and students of Atlantic College. The progress of Atlantic College’s Eco-Code is currently being monitored by Megan Jones of the Welsh Assembly. Whilst the high level of motivation and passion at Atlantic College was essential to the speed at which this case study was conducted, the author concedes that not all schools have the same level of institutional commitment and drive. Conducting the APM forged links both within the school and between the school, NGOs and the regional government. It is hoped that these links will support Atlantic College as it works to achieve the aims and policy set in the Eco-Code.

Given the APM’s success in supporting Atlantic College’s progress from Environmental Review to Eco-Code, the author offers the following recommendations to UNEP, FEE and *Eco-Schools Wales*:

- Focus on offering a framework to support and enable simple prioritising of aims and change after the Environmental Review.
- Experiment with the APM as an option for achieving the aim suggested above.

Experimentation with the APM in other schools, when carried out by a variety of different leaders and evaluators independent from the leaders of the respective schools, may help to determine factors such as whether the role played by the researcher in this study is best performed by an external assessor, a teacher or a member of an NGO. Experimentation of this kind will also help to define which aspects of the process were specifically applicable to Atlantic College and which aspects are “best practices” which can be adapted and made use of in other schools-based ESD programmes.

To date, schools in Hawaii and groups in Russia and Japan have expressed interest in adapting and using the APM introduced in this paper in their own regional contexts. The researcher will provide details of the work at Atlantic College to these groups and is available for advice and feedback as required. The author would like to invite any other interested groups or individuals to join in the second phase of this research.

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Notes

¹ The International Baccalaureate is an internationally accepted pre-university examination developed at Atlantic College and taught across the globe. Students study two languages, one science subject, mathematics, one subject from the humanities and one “arts” subject or an additional subject from another subject field. In addition, students study the “Theory of Knowledge” and write an extended essay. The award of the diploma also depends on student completion of voluntary work in the local community.

² CABE — the UK Government's Commission on Architecture and the Built Environment, charged with promoting good design in England and Wales — concluded that there are no “typical” schools in the UK, upon completion of a nationwide survey of schools in the UK (Warwick, cited in Usable Buildings Trust 2006).

³ This calculation uses figures taken from Wackemagel and Rees (1996) who suggest that an acre of trees is able to absorb 3 tons of CO₂ per annum.

⁴ This calculation — using figures taken from Meyer Hillman (2004) — suggests that the conversion factor from kilometres in a diesel car to kilograms of CO₂ is 0.14.

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